

Study of Hybrid Annuity Model (HAM) Contract in Highway Construction Contractor and Owner Aspect

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Abstract – Following the policy change in the mid-1990s India has embarked on a brisk pace of highway development that gave a high priority to highway development in country. In 1997 to develop a large highway network in a relatively short period of time the National Highway Development Programme (NHDP) was launched. In India, road projects are awarded via : Build-Operate- Transfer (BOT)-Annuity, BOT-Toll, Design, Build, Finance, Operate and Transfer (DBFOT) model and EPC (engineering, procurement and construction) contract. After the BOT model of Public Private Partnership (PPP), an advanced version of the Model Concession Agreement (MCA), presently called as Hybrid Annuity Model (HAM) is paving way for road projects. Now National Highway Authority of India (NHAI) has adopted Hybrid Annuity Model (HAM) for highway development. The hybrid model is supposed to be a win-win situation for the government and developers. The government is expected to fund up to 40 percent of the project cost while the remaining 60 per cent to be funded by the private player, and thus easing the financial burden on the exchequer as well. This paper discuss the various features of HAM in road sector of India, later it compares the Hybrid Annuity Model (HAM) with the conventional DBFOT model of road construction so as to find out the benefit and risk associated with HAM both for owner & contractor prospective.

Keywords – Highway Development, Highway network, NHAI, HAM, DBFOT, Risk, PPP, BOT, NHDP.

I. INTRODUCTION

The country moves on roads are an important asset of country. In India roads carry approx 67% of freight and 88% of passenger traffic and it is estimated that the road traffic has been growing at 10-15% per annum. India has the 2nd largest highway network in the world with over approx 5.23 million km at present, consisting of Expressways, National Highways, State Highways, Major District Roads, Other District Roads and Village Roads. Highways are considered to be more important among the roads as they connect different parts of the country and also with other countries border. National Highways (NH) traverse the length and width of the country connecting the National and State capitals, major ports and rail junctions and link up with border roads and foreign highways and serve as arterial roads for movement of passengers and goods. The total length of NH (including expressways) in the country is 115,235 kms. While National Highways constitute only about 2% of the length of the country's road network, they carry about 40% of the road traffic.

As on March 31, 2017, out of the total 55,886 Km (7097Km with Ministry of Road Transport & Highways) of National Highways that are planned to be developed and upgraded by NHAI, 39,581 Km of National Highways contracts have been awarded. Out of this 28,479 Km have been completed and work on 11,102 Km is in progress. As per Annual Report of Ministry of

Statistics and Programme Implementation (MOSPI), GOI, F.Y. 2016-17 the main focus of the government on infra development is on road sector. As per Ministry records, as on 1 October 2016, 1174 projects with an anticipated cost of Rs 16,16,457.43 crore were on the monitor of the Ministry. 1174 projects are shown in the figure below sector wise break up ;



Fig. 1. Source: Annual Report of Ministry of Statistics and Programme Implementation (MOSPI), GOI, F.Y. 2016-17.

As shown in the figure above, approximately 36.71% of total projects under implementation during FY 2016-17 pertained to Road Transport & Highways.

Three different models – PPP Annuity, PPP Toll and EPC (Engineering, procurement & construction) were followed by the government while adopting private sector participation. The revised Model Concession Agreement (MCA), now called as Hybrid Annuity Model (HAM) is a welcome change over all the previous Build Operate Transfer (BOT) model of Public Private Partner-ship (PPP).

In January 2016 the GOI has introduced, HYBRID ANNUITY MODEL (HAM) to rejuvenate PPP. By options the HAM may be a combine between the present 2 models- larva regular payment and EPC. Hence to understand HAM, we should know the basic features of the existing PPP models.

Engineering, Procurement and Construction (EPC)
Under this model, the value is totally borne by the govt. Government invites bids for engineering knowledge from the private developers. Procurement of raw materials and construction cost are met by the government. The private sector participation is minimum and is limited to the provision of engineering expertise. Drawback of the models is high financial burden to the government.

The Build Operate and Transfer (BOT) Annuity
Under BOT Annuity, a developer builds the highway, operates it for the specified duration and transfer it back to the government. The government starts payment to the developer when the launch of business operation of the project. Generally Payments are made on 6 month basis.

Bot Toll
In this Toll based mostly larva Model, a road developer constructs the road and allowed to recover his investment through toll collection. This toll assortment are going to be over a amount of nearly thirty years in most cases. There is a government payment to the developer as he earns his money invested from Toll.

Hybrid Annuity Model (HAM)
HAM's a hybrid — a combination of the EPC (engineering, procurance and construction) and larva (build, operate, transfer) models. Now, HAM combines EPC (40 per cent) and BOT-Annuity (60 per cent). On behalf of the govt, NHAI releases forty per cent of the entire project value. It is given in 5 tranches joined to milestones. The balance sixty per cent is organized by the developer. There is no toll rights for the developer. Under HAM, Revenue collection would be the responsibility of NHAI.

Spreading the risk between developers and the Government HAM could be a sensible trade-off. Thus there is great scope of highway development through HAM model, this paper will help to understand the various attributes of HAM with reference to client and contractor prospective for projects by NHAI.

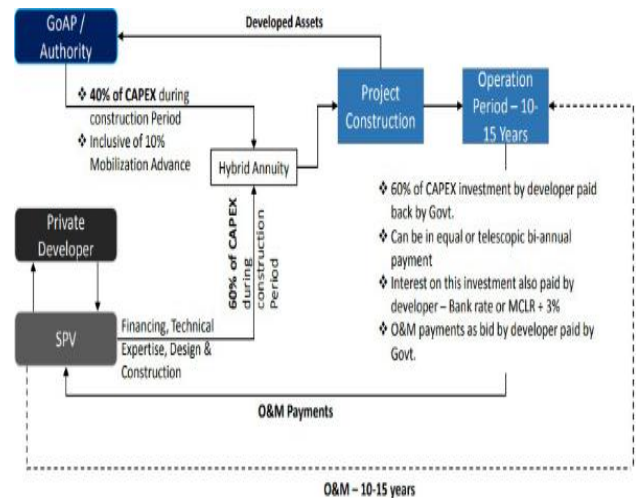


Fig.2. Developed Block-diagram provides an overview of the HAM Model.

Features of Hybrid Annuity Model

Bid parameter: Bid is awarded to the developer quoting lowest NPV for project life cycle value. Project life cycle value outlined as net present value (NPV) of the quoted bid project value and NPV of the operations and maintenance (O&M) value for the entire operations period is the bid parameter.

Construction Cash Support: forty percentage of the bid project value shall be awarded to the concessionaire by the authority in 5 equal installments coupled to physical progress of the project. Concessionaire /Private Party shall need to at first bear the balance 60% of the project value through a mix of debt and equity.

Escalation clause within the project cost: Project cost shall be inflation indexed (through a index number Multiple) (PIM), which is the weighted average of Wholesale Price Index (WPI) and Consumer index number (CPI) (IW) within the quantitative relation of 70:30. The bid project value adjusted for variation between the value index occurring between the reference index preceding the bid date and reference index date like a shot preceding the appointed date shall be deemed to be the bid project value at commencement of construction.

Stable cash flow of annuity payments: Semi-annual annuity payments shall be created to the concessionaire /Private Party by the Authority on completion of the project for the balance hour of the final bid project cost. The payments are aligned with typical revenue profile for road comes. Along with the annuity payments, interest shall be paid within the kind of grant on reducing balance of ultimate construction value.

Assured O&M payouts by authority: O&M payments shall be created to the small businessman in conjunction with rent by the Authority, in accordance with the quantity quoted which can be inflation indexed.

Revenue for authority: Toll assortment shall be the responsibility and revenue of the authority.

Concession Period: It shall comprise construction amount, which shall be project specific, with a set operations amount of fifteen years.

Comparison of Features in Concession Agreement of HAM Road Project VIS-À-VIS Conventional Dbfot Project

Concession Period

Conventional DBFOT project clauses – Concession period is fixed from the appointed date and it comprises of construction and operations period. This arrangement reduces the operations amount if there's delay in action of tentative commercial operations date (PCOD). For example, concession period is seventeen years from the appointed date which also include construction duration of 730 days. In this case, number of annuities to be received by concessionaire / Private Party reduces from 30 to 29 if there is delay of six months in achievement of PCOD.

Hybrid annuity project clauses - Concession period includes permanent operational period of fifteen years from COD. Hence, numbers of annuities square measure seated at thirty regardless of delay in action of PCOD. However, Authority can levy damages or withheld performance securities for the delays associated to concessionaire/ Private Party.

Impact Analysis- Positive for developers and lenders as it presents revenue visibility.

Damages for delays attributed to the concessionaire

Conventional DBFOT project clauses – If COD does not occur prior to 91st day after scheduled project completion date (SPCD) unless the delay is on account of reasons solely attributed to the authority or calamity, the concessionaire /Private Party shall pay damages to the NHAI in a sum calculated at rate of 0.1% of the amount of performance security for delay of each day until COD is accomplished

Hybrid annuity project clauses - In the sequence mentioned here, damages amount increases to 0.2% of the amount of performance security for delay of each day until COD is accomplished. Upon concession/ Private Party failure to pay damages, the same shall be paid with interest of bank rate plus 3% and shall be deducted from the running annuity payments till the recovery of entire damages..

Impact Analysis- Positive for the authority and more binding on concessionaires to complete the project within stipulated time frame.

Bidding criteria

Conventional DBFOT project clauses – Authority mentions project- specific Engineering procurement and construction (EPC) cost in the request for proposal. Yet,

concessioner will freeze the project value supported technical viability on its own because it isn't the bidding parameter.

Hybrid annuity project clauses - Bid project cost is decided on the date of declaration of bidder offering lowest project life cycle cost (including construction cost and O&M cost) and hence the project value cannot be altered except variations in PIM and alter in scope. Bid project value shall be inclusive of construction value, interest during construction, working capital and physical contingencies except additional cost due to variations in PIM, change in scope, and change in law or force majeure. Moreover, concessionaire is also required to extend additional performance security to the NHAI in the form of unconditional irrevocable guarantee from a bank if the bid project cost of the selected bidder is lower by over hundred percent of calculable project value of authority.

Impact Analysis- Positive for authority and lenders. Moreover, this requires in-depth study of project cost by bidder based on the design and specification of scope of work. Emphasis on value primarily based bidding and handiness of the recent value estimates by NHAI is anticipated to slim the distinction between NHAI value and bidding value which may ultimately result in lower funding demand for developers and lower exposure of banks.

Obligations of authority

Conventional DBFOT project clauses – No clauses for rehabilitation and resettlement.

Hybrid annuity project clauses - Authority undertakes rehabilitation and resettlement of persons affected by construction of project and has to bear all cost and expenses thereof. Authority is additionally needed to obtain forest clearance as a condition precedent to concession agreement.

Impact Analysis- Positive for developers as it shall result in increase in high pace of construction.

Financial closure

Conventional DBFOT project clauses – Financial closure is to be achieved within 180 days from signing of concession agreement.

Hybrid annuity project clauses - Financial closure is to be achieved within 150 days from signing of concession agreement.

Impact Analysis- Neutral to positive: Lower quantum of debt tie-up requirement combined with annuity based revenue model is expected to ease the financial closure process.

Deemed termination

Conventional DBFOT project clauses – No such clauses.

Hybrid annuity project clauses - In case, appointment date does not occur before the 1st anniversary of the signing of Concession agreement, the concession agreement shall be deemed to have been terminated by mutual agreement of the parties. Moreover, if appointed date doesn't occur for the explanations attributed to concessioner, authority shall en-cash performance security and extra performance security as damages therefrom.

Impact Analysis- Protects the concessionaire from inordinate delay in handover of land or regulatory clearances from the authority.

Project milestone

Conventional DBFOT project clauses – Project milestone only linked to financial progress .

Hybrid annuity project clauses - Project milestone is linked to both physical and financial progress.

Impact Analysis- Protects from diversion of funds by concessionaire /Private Party .
Release of construction grant

Conventional DBFOT project clauses – Construction grant, if any can be disbursed in the proportionate form of term loan disbursement after infusion of 100% contribution from sponsors.

Hybrid annuity project clauses - Authority shall provide construction grant to the extent of 40% of the inflation indexed bid project cost. Construction concession is to be released in the form of five equal installments subject to the achievement of physical progress of 20%, 40%, 60%, 75% and 90% respectively.

Impact Analysis- Positive for developers and lenders as funding of the 40% of the project cost from the authority is expected to ease the funding need. Moreover, alignment of concession release with the achievement of physical progress is also expected to incentivize the concessionaire/ Private Party for timely completion of work.

Mobilization advances

Conventional DBFOT project clauses – Concessionaire/ Private Party can grant mobilization advances to EPC contractor from the cost of project. No mobilization advances is granted from NHAI during construction period.

Hybrid annuity project clauses - Mobilization advances can be availed from NHAI up to 10% of bid project cost @ bank rate of RBI compounded annually during construction period. Such mobilization advances are to be reduced in four equal installments from construction grant by authority. Interest on such advances shall be recovered because the fifth and final installment upon termination of

one hundred twenty days commencing from the recovery date of 4th installment.

Impact Analysis- Positive for developers as mobilization advances are available at bank rate which is currently 7-8%.

Bonus payment on early completion
Conventional DBFOT project clauses – Bonus upto maximum one annuity (six months) shall be paid by authority along with first annuity subject to fulfillment of final COD (100% completion of work on the entire project length). Moreover, annuity payment shall commence only after 6 months from scheduled project completion date (SPCD).

Hybrid annuity project clauses - In the event concessionaire shall achieve COD on 30 or more days prior to scheduled completion date, NHAI shall pay bonus equal to 0.5% of 60% of bid project cost for 30 days by which COD shall precede SPCD. Moreover, the bonus shall be calculated on pro-rata basis. Bonus shall be due and payable along with the first annuity payment. Annuity payment shall commence within 15th days of 180th days from COD.

Impact Analysis- Positive for developers as bonus payment can be received even after completing 100% work on the lands available to concessionaire within 180 days from appointed date. Furthermore, realigning annuity payments to COD as compared with SPCD increases the internal rate of return (IRR) for the project.

Release of performance security

Conventional DBFOT project clauses – Performance security can be released after 1 year from appointed date or achievement of 20% of financial progress by concessionaire/ Private Party.

Hybrid annuity project clauses - Performance security can be released after 1 year from appointed date or achievement of 30% of financial progress by developer. Additional performance security can be release after achievement of milestone-III (i.e. 75% of physical progress).

Impact Analysis- More binding on concessionaire/ Private Party and increases performance obligation of developer.

Change in scope

Conventional DBFOT project clauses – NHAI shall pay the concessionaire any increase in scope of work approved by independent engineer. In the event of reduction in scope of work due to reasons attributed to authority or force majeure, annuity payment shall be deducted based on the cost assessed by independent engineer.

Hybrid annuity project clauses - Same clause in case of increase in scope. While in case of reduction in scope due

to reasons attributed to the authority, cost of such reduced cost is to be accessed by the independent engineer (IE) and bid project cost would be reduced by 107.54% of the civil cost for reduced scope. O&M payments shall even be hyperbolic or reduced in proportion of amendment within the length of project main road because of amendment in scope.

Impact Analysis- Neutral. Further, alignment of O&M payments with project length is favorable for the authority.

Maintenance obligations prior to appointed date

Conventional DBFOT project clauses – Authority is responsible for the maintenance obligations.

Hybrid annuity project clauses - Developer is responsible as a part of bid project cost. In case appointed date is not achieved and concession agreement is terminated prior to appointed date, NHAI shall reimburse the concessionaire /Private Party based on lump sum per km rate mentioned in the concession agreement.

Impact Analysis- Positive for the authority and more binding on Private Party /concessionaire for timely achievement of appointed date.

Termination payment under Private Party /concessionaire event of default prior to COD

Conventional DBFOT project clauses – No termination payment. Hybrid annuity project clauses - Termination payment is allowed subject to achievement of 2 milestone for the payment of grant (i.e. 40% of the physical progress). Termination payment shall be paid in the range of 50-80% of the debt due or 9-32% of the project cost whichever is less minus insurance cover depending upon achievement of 2 to 5th milestone for unharness of construction grant.

Impact Analysis- Positive for the Private Party/ concessionaire as it protects their interest to a considerable extent.

Obligations relating to refinancing

Conventional DBFOT project clauses – No such clauses. Hybrid annuity project clauses - Authority shall permit and enable Private Party/concessionaire for refinancing as per prevailing guidelines upon written request. Impact Analysis- Positive for the developers and lenders.

HAM- Government Prospective

Ease the cash flow pressure

As in the case of EPC contracts govt. has to fund all project cost as per the running bills thus there is a financial burden to the govt. but by adopting HAM projects govt. is liable to pay a fixed annuity amount that also at fixed milestone level thus there is an ease in cash flow pressure to the govt.

Source of Revenue

The authority is designated to collect toll during operational period which is expected to form good source of revenue against payment made to concessionaire in the form of annuities.

Attract more private sector participation

The main object of the hybrid annuity model is to realign risk allocation based on ground level realities of the market thereby bringing about a revival in investor confidence. This will attract more private investment in the highway infrastructure.

Speedy completion of projects

To ensure the project completion on time, this model has having sharp penalty for government as well as concessionaire if there is any delay in fulfilling their obligations. Pace of execution is also expected to improve due to stringent clauses for the damages and encashment of performance as well as additional performance security in the case of delay by Private Party /concessionaire as compared with conventional DBFOT model.

O & M by Private sector

Operation and maintenance by private player. Better expertise, better quality of services as the private sector is better equipped to ensure efficient construction, maintenance and operation of infrastructure projects.

HAM- Contractor/Lenders Prospective

Reduces sponsor's risk for funding equity commitment:

Aggressive bidding, high debt levels and increasing working capital intensity as well as execution challenges had mutually affected the credit profile of some of the large developers has increased the funding risk throughout construction part and reduced participation of developers in DBFOT model. At the same time, developers with strong execution capability and good financial flexibility are better placed to grab the sizeable opportunity in the road sector. HAM model entails lower sponsor contribution during construction period considering 40% construction support from authority and hence mitigate the funding risk to an extent. Moreover, provision of mobilization advances from NHAI is also expected to provide some support to concessionaire in the initial phase of construction.

Reduction in construction risk:

Construction risk is partially reduced due to availability of 80% length of project before appointed date and NHAI's efforts for providing faster clearances as well as support in rehabilitation. Provision of deemed termination and clauses to issue final COD just in case of completion of 100% work on the lands offered at intervals one hundred eighty days from appointed date conjointly protects the interests of developers and lenders to a considerable extent.

Protection of lender’s interest in the event of termination:

Lenders are partly secured in the event of concessionaire event of default prior to COD. As per concession agreement, in the event of termination, debt due is calculated based on the lower of NHAI cost and bid project cost. Given that current trend indicates relatively lower variations between the NHAI project cost and bidder project cost, the lenders are protected to a considerable extent compared to conventional DBFOT model.

O&M risk partly mitigated:

O&M risk is also partly offset due to fixed payment in the form of annuity which is also indexed to inflation movements. However, Private Party/ concessionaires would still face the risk of sharp increase in the O&M cost due to more than behold wear and tear.

Assured cash flow in the form of annuity payments:

During operational stage, cash flow is assured in the form of annuity payments on semiannual basis covering 60% of the project cost along with the interest.

Reduction of interest rate risk:

Interest shall be paid on reducing balance of cost. Rate of interest for the same shall be Bank rate + 3 % (currently 10.00% per annum). However, ample lag between fall in bank rate and reduction in base rate by lender will scale back the margin of safety Associate in Nursing increase rate risk to an extent.

NO tolling risk;

Private parties are relieved from the risk of tolling in this model as toll collection under this model would be done by government through NHAI.

The brief picture of Risk Allocation can be tabulated as in below Table

Table-I : Risk Allocation in Different Contract Models

Type of Risk → Type of Model ↓	Financing Risk	Revenue Risk or Toll collection Risk	O & M Risk
BOT Model	By Private	By Private	By Private
Annuity Model	By Private	By Govt.	By Private
BOT-VCF Model	By Govt. & Private	By Private.	By Private
EPC Model	By Govt.	By Govt.	By Govt.
HAM Model	By Govt. & Private	By Govt.	By Private

For readers who would like to know more about other changes in HAM model and its comparison with provisions in earlier BOT and Annuity models, a detailed risk allocation chart is prepared and attached below.

It is conceded that no model (BOT/ Annuity/HAM) can be free from all risks.

Table -II: Risk allocation amongst Toll, Annuity and Hybrid model.

Risks	BOT Toll	BOT Annuity	Hybrid Annuity
Preconstruction			
a) Environment, forest clearances, Right of Ways	Responsibility of Handing over ROW on at least 80% of required area, Environmental protection: Conservations, Forest Clearances will be procured by the Authority.		
Construction Risk			
a) Cost overrun	Concessionaire to bear all risk		
b) Time overrun	Concessionaire to bear all risk		
c) Quality	Concessionaire to bear all risk		
Financing Risk			
a) Achieving Financial closure in time	Concessionaire to bear all risk		
b) Financing cost overruns	Concessionaire to bear all risk		
a) Interest Rate	Concessionaire to bear all risk		
b) Repayment	Concessionaire to bear all risk		
c) Foreign Exchange	Concessionaire to bear all risk		
Revenue			
a) Traffic volume	Shared by concessionaire & Authority. If average Traffic volume falls below 2.5% of targeted traffic on targeted date (approx. 10 years after start of operations) Concession period is extended by 1.5% per 1% of shortfall. If Actual traffic exceeds the targeted traffic by 1% the Concession period is reduced by .75%.	Not relevant	NHAI to take a risks
b) Toll leakages	Concessionaire to bear all risk	Not relevant	NHAI to take a risks
c) Tariff Rates	Tariff rates are decided as per National Tariff Policy. Hence there is no ambiguity involved. However revenue may reduce if the WPI does not rise as per original expectations of the Concessionaire.	Not Relevant	NHAI to take a risks
d) Competing road	Concessionaire to be compensated suitably if traffic exceed capacity	Not Relevant	NHAI to take a risks
Operations Risk			
a) Annual O&M	Concessionaire to bear all risk		
b) Additional Periodic Maintenance	Concessionaire to bear all risk		
Economic Risks			
a) Taxes	Concessionaire to bear all risk		
b) Inflation	Concessionaire to bear all risk		
Force Majeure (FM) events			
Time extension			
a) Before Financial closure (Appointed Date)	Time set forth for achieving Financial closure extended by time of FM event		
b) Between Appointed Date and Commercial Operation date (COD)	Time set forth for Project completion extended by time of FM event Non-political FM: Respective parties to bear the costs. Neither party is required to pay other party		
c) After COD	Concession period extended by time of FM event	---	Concession period not extended. But Concessionaire will continue to receive Annuity
Cost arising out of FM event			
a) Before Appointed date	Cost to be borne by Concessionaire & Authority respectively		
b) After Appointed Date	Non Political Event : Cost to be shared by respective parties Indirect Political event : To be shared Direct Political : Cost compensated by Authority		
Hand Over Risks			
a) Quality of Road	Concessionaire to bear all risk		
b) Default of Concessionaire	Pay 90% of Debts due at that time	Pay 90% of Debts due at that time	During Operations: 65% of debt due; During construction: 50% to 80% of debt due of 9% to 32% of Bid project cost whichever low
c) Default of Govt / NHAI	Pay all debts plus 150% of equity	Pay all debts plus 150% of equity	Before COD: All debt due or 9% to 40.5% of BID Project Co whichever low plus 150% of equity; After COD: All annuity payments due at transfer date

II. CONCLUSION

GOI introduced the National highway development plan (NHDP) in 1997 to develop the NH through PPP model. But, due to financial instability, GOI has introduced Hybrid Annuity Model (HAM) in Road development to rejuvenate PPP.

The objective of the present study was to understand the various features and latest trends of HAM in road sector in India, to accomplish this objective I compared the

HAM with the conventional DBFOT model of highway development, so as to extract the advantages and risk associated with HAM. Firstly, a brief introduction of road development programme like public private partnership (PPP) in India is presented. Then the Paper describes the various clauses and attributes of HAM. Then, the DBFOT and HAM are compared to identify the advantages and risk associated with HAM model both for NHAI and contractor prospective.

I identify that, HAM is one of the potential solutions for road development as it distributes the financial risk between government and the private players. HAM is expected to benefit the road sector with the increase in the pace of award of contract and addressing the drawbacks of the earlier toll based and annuity based projects. While the HAM resolves most of the issues affecting the project development under earlier models such as BOT (toll), possible concerns that could arise in the future are extent of government funding that could be made available year on year to fund such huge demanding projects. Such government funding are limited as was seen in case of annuity based projects. A second risk could be the Government potential of collecting tolls on specific projects against the local/political pressure which may lead to possibilities of huge corruption.

Finally, the findings of this paper will assist the highway agencies as well as the private firms in significant improving the construction process and project management, which will ultimately result in enhanced highway project planning and reduced exposure to litigation with minimizing the risk to the concern players.

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